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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/578,507	05/26/2000	Natarajan Ramasubramanyan	2827-4	7987

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EXAMINER

SANDALS, WILLIAM O

ART UNIT	PAPER NUMBER
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1636

DATE MAILED: 04/10/2003

13

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/578,507

Applicant(s)
Ramasubramanyan

Examiner
William Sandals

Art Unit
1636



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jun 5, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29, 41-51, and 54-64 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27, 41-47, 51, and 54-62 is/are rejected.
- 7) ☒ Claim(s) 28, 29, 48-50, 63, and 64 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 11 6) ☐ Other:

Art Unit: 1636

DETAILED ACTION

Status of the Claims

1. Claims 1-29, 41-51 and 54-64 are pending. Claims 30-40 and 52-53 have been cancelled. Claims 1, 5, 15, 45 and 46 have been amended. Claims 54-64 are newly entered in Paper No. 12, filed June 5, 2002.
2. Amendments to claim 1 in Paper No. 12, have overcome the rejection of claim 1 under USC 35 112, first paragraph, and the rejection is withdrawn.
3. Amendments to claims 1, 15 and 45 in Paper No. 12, have overcome the rejection of claims 1-16 and 45 under USC 35 112, second paragraph, and the rejection is withdrawn.
4. Arguments in Paper No. 12, regarding the anticipation rejection of claims 1-6, 10-25, 29-46 and 49-53 under USC 35 102(e), have been found persuasive, and the rejection is withdrawn.
5. Arguments in Paper No. 12, regarding the obviousness rejection of claims 1-25, 29-46 and 49-53 under USC 35 103(a), have been found persuasive, and the rejection is withdrawn.
6. Claims 44-46 are rejected over new grounds of rejection under 35 USC 112, second paragraph.
7. Claims 1, 2, 4-6 and 10-16 are rejected over new grounds of rejection as anticipated under 35 USC 102(e).
8. Claims 1-27, 41-47, 51 and 54-62 are rejected over new grounds of rejection as obvious under 35 USC 103(a).

Art Unit: 1636

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 44-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

11. Claim 44 recites the limitation "said hydrophobic resin" in line 1. There is insufficient antecedent basis for this limitation in the claim.

12. Claim 45 recites the limitation "said resin" in line 1. There is insufficient antecedent basis for this limitation in the claim.

13. Claim 46 recites the limitation "said support" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Art Unit: 1636

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

15. Claims 1, 2, 4-6 and 10-16 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,441,160 B2 (Kitamura et al.).

Kitamura et al. teach the method of purifying plasmid DNA from a mixture of DNA, RNA and protein by hydrophobic interaction chromatography as claimed in the instant claims 1, 2 and 4-6. The mixture is applied to the hydrophobic interaction chromatography media in high salt buffer. The salt concentration (ammonium sulfate) is 1-4.5 molar, at a pH between 6 and 8 (see Kitamura et al. at the abstract and column 7, lines 1-17, and pH 7.5 at column 9, line 24). The mixture is bound to the hydrophobic interaction chromatography media. An eluate buffer is applied to the hydrophobic interaction chromatography media to release the plasmid DNA (see Kitamura et al. at column 11 and 12). No organic solvents, detergents, glycols, hexamine cobalt, spermidine or polyvinylpyrrolidone are used in the method. As claimed in instant claims 12-16, the hydrophobic interaction chromatography media is composed of a solid support which may be methacrylate ethylene glycol, and may be a bead with an attached pendant group, which may be alkyl $C_2 - C_{20}$ (see Kitamura et al. at columns 3-4)

Art Unit: 1636

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 1-27, 41-47, 51 and 54-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kitamura et al. at. in view of Prazeres et al.

The claims are drawn to a method of purifying (supercoiled) plasmid DNA from a mixture of DNA and impurities by hydrophobic interaction chromatography. The mixture is applied to the hydrophobic interaction chromatography media in high salt buffer. The salt concentration (which may be NaCl or ammonium sulfate) may be from 1-4 molar, the pH may be between 6.8 and 7.4. The mixture is bound to the hydrophobic interaction chromatography media. An eluate buffer is applied to the hydrophobic interaction chromatography media to release the plasmid DNA. No organic solvents, detergents, glycols, hexamine cobalt, spermidine or polyvinylpyrrolidone are used in the method. The hydrophobic interaction chromatography media is composed of a solid support which may be methacrylate ethylene glycol, and may be a bead with an attached pendant group, which may be alkyl C₂ - C₂₀. The impurities may be RNA and endotoxin (lipopolysaccharide).

Art Unit: 1636

Kitamura et al. teach the invention as described above in the anticipation rejection of claims 1, 2, 4-6, 10 and 12-16 under 35 USC 102(e).

Kitamura et al. did not teach that the plasmid may be supercoiled, nor that the salt may be NaCl at a concentration of about 2M-4M, nor that the impurities may include endotoxin (lipopolysaccharide).

Prazeres et al. teach the isolation of supercoiled plasmid DNA from a mixture of supercoiled plasmid, relaxed plasmid, DNA, RNA and endotoxin (lipopolysaccharide) in a method using hydrophobic interaction chromatography media in high salt buffer (see the abstract, introduction, page 34, column 2 bridging to page 35, page 43 and the figures). The salt concentration may be 2 molar NaCl (see page 34, column 2).

Kitamura et al. and Prazeres et al. teach a method of purifying plasmid DNA from a mixture of DNA and impurities by hydrophobic interaction chromatography. The mixture is applied to the hydrophobic interaction chromatography media in high salt buffer and the purified plasmid DNA is eluted at a lower salt concentration. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the method of purifying plasmid DNA from a mixture of DNA and impurities by hydrophobic interaction chromatography of Kitamura et al. and Prazeres et al. because they were both teaching a method of purifying plasmid DNA from a mixture of DNA and impurities by hydrophobic interaction chromatography. One of ordinary skill in the art would have been motivated to modify the method of purifying plasmid DNA from a mixture of DNA and impurities by hydrophobic

Art Unit: 1636

interaction chromatography of Kitamura et al. with the method of purifying supercoiled plasmid DNA which includes removing endotoxin of Prazeres et al. for the expected benefit of producing a pharmaceutical grade supercoiled plasmid, which will meet the demanding standards of regulatory agencies, as stated in Prazeres et al. at the introduction on page 31. Further, a person of ordinary skill in the art would have had a reasonable expectation of success in the producing the instant claimed invention given the teachings of Kitamura et al. and Prazeres et al. in a method of purifying plasmid DNA from a mixture of DNA and impurities by hydrophobic interaction chromatography.

Allowable Subject Matter

18. Claims 28, 29, 48-50, 63 and 64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

19. Certain papers related to this application are *welcomed* to be submitted to Art Unit 1636 by facsimile transmission. The FAX numbers are (703) 308-4242 and 305-3014. The faxing of such papers must conform with the notices published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant *does* submit a paper by FAX, the original copy should be retained by the applicant or

Art Unit: 1636

applicant's representative, and the FAX receipt from your FAX machine is proof of delivery. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office.


Any inquiry concerning this communication or earlier communications should be directed to Dr. William Sandals whose telephone number is (703) 305-1982. The examiner normally can be reached Monday through Thursday from 8:30 AM to 7:00 PM, EST. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Remy Yucel, Ph.D. can be reached at (703) 305-1998.

Any inquiry of a general nature or relating to the status of this application should be directed to the Tech Center customer service center at telephone number (703) 308-0198.

William Sandals, Ph.D.

Examiner

March 26, 2003


REMY YUCEL, PH.D
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600